(54) Title: INTERACTIVE WIRELESS INFORMATION AND COMMUNICATIONS AGENT
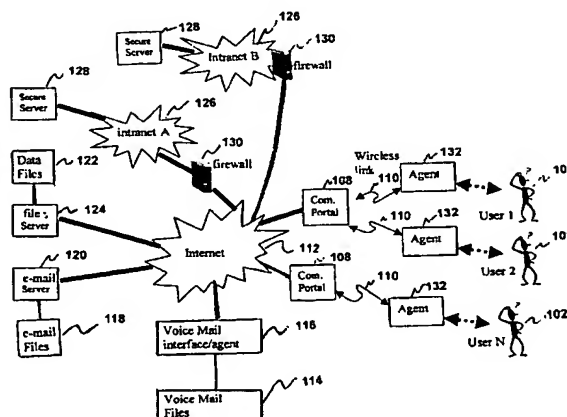
(57) Abstract: A system and method for an interactive information and communications agent (132) that prepares and customizes user-desired information, and manages user communications via wireless links (110). The agent (132) provides the desired information and communications services to a user via interactive communications environment. The agent (132) serves as a mobile personal secretary to a user (102) in an electronic format (i.e., software & hardware). The agent (132) searches the intranet (126) and/or the Internet (112) based on user commanded keywords and user defined preferences in his profile. The user preference profile enlists the default order of information to receive and defines the user's range of interest and keyword sets. The agent (132) delivers the information to the user (102) based on the profile once the user (102) activates the system. The user (102) may perform various operations on delivering information (e.g., pause, replay, fast forward, etc.), may change the default delivery order at real time, and can issue a new search. The agent (132) can also perform the communications management functions including registration of user's location receiving or orginating calls/messages for the user, and sending commands to functional devices.

INTERACTIVE WIRELESS INFORMATION AND COMMUNICATIONS AGENT

FIELD OF THE INVENTION

This invention relates to the field of communications, and more particularly to the wireless digital communication.

DESCRIPTION OF THE RELATED ART

The Internet is a global computer network providing access to a large, distributed body of information. The collection of information accessible throughout this network is generally not organized or indexed, making the task of locating useful information difficult. The difficulty of finding and retrieving information is exacerbated by the multiplicity of protocols used for interacting with information and service providers, numerous formats for different types of multimedia data, and the rapidly growing and changing topology of the network.

E-mail was one of the first services developed on the Internet. Today, e-mail is an important service on any computer network, not just the Internet. E-mail involves sending a message from one computer account to another computer account. E-mail is used to send textual information as well as files, including graphic files, executable file, word processing and other files.

With the explosive growth of all forms of electronic messaging including e-mail, voice mail, stored fax, and stored video messages the volume of information has become enormous. Sorting through the various electronic messages stored on a variety of networks is time consuming and can easily be overwhelming.

Wireless communications facilitates the delivery of information between the transmitter and the receiver without a physical wired connection. Such advantage translates to the freedom of mobility for the users and to the savings of wiring nuisance

for the users. However, timeliness of information is one key factor to efficiency improvement and potential business success. When a user is away from their primary gateway for accessing information (e.g., office or home), or when a user simply has to manage multiple gateways of information, timely delivery of desired information is a significant challenge.

Recent rapid commercial development of Internet, multimedia applications, e-mail, digital messaging and other digital content has created a strong demand for efficient remote assess to a primary source of digital information. Prior attempts to resolve this problem have essentially provided broadcast services and personal communications services. Broadcast services provide information in an undistinguished manner. That is, every user receives the same information regardless the user's interest. The existing personal communications services (such as cellular, satellite, etc.) can provide user desired data but it is always based on a user's particular request at that instant of time.

Software agents are used to filter, sort and even respond to message such as e-mail, voice mail, and text pagers. Some software agents will attempt to locate a user to inform them that they have messages waiting their action. This information may even be prioritized. However, there is a need for a system, which can dynamically manage the information from diverse communication sources, be dynamically responsive to a user's remote requests, and coordinate and control multiple intelligent agents operating for the same user.

SUMMARY OF THE INVENTION

The present invention is a system and method for an interactive communication of information. A communications agent prepares and customizes user-desired information, and manages user communications via wireless links.

BRIEF DESCRIPTION OF THE DRAWINGS

A more complete understanding of the present invention may be obtained from consideration of the following description in conjunction with the drawings in which:

FIG. 1 is a high level diagram of a communication network employing the present invention;

FIG. 2 is a high level diagram of a communication network employing the present invention with multiple agents;

FIG. 3 is a high level diagram of a communication network employing the present invention with multiple agents and multiple users; and,

FIG. 4 is a high level diagram of a local interactive communication agent.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

The present invention is a system and method for dynamic management of information that addresses the integration of information and communication services and provides real time interactive ways to such services. An interactive communications agent prepares and customizes user-desired information, and manages user communications via wireless links. The interactive communications agent provides the desired information and communications services to a user in an interactive communications environment. The interactive communications agent serves as a mobile personal secretary to a user in an electronic format (i.e., software & hardware). The interactive communications agent searches the intranet and/or the Internet based on user commanded keywords and user defined preferences in his profile. The user preference profile enlists the default order of information to receive and defines the user's range of interest and keyword sets. The interactive communications agent may collect/update the information based on the user preference profile. The interactive communications agent

delivers the information to the user based on the profile once the user activates the system. The user may perform various operations on delivering information (e.g., pause, replay, fast forward, etc.), may change the default delivery order at real time, and can issue a new search. The interactive communications agent can also perform the communications management functions including registration of user's location, receiving or originating calls/messages for the user, and sending commands to functional devices. The interactive communications environment between the interactive communications agent and the user are based on voice (e.g., voice recognition and synthetic voice), displays, keyboards and/or other input/output devices. The wireless link between the interactive communications agent and the network can be provided via a cellular connection, satellite, wireless data service or wireless local area network (WLAN).

Intelligent agents are known to those skilled in the art. An intelligent agent is essentially a device, or method, which enables a device, to simulate the knowledge base or problem solving abilities of a human assistant or agent. As an example, the intelligent agent can be taught that the phrase "Hank and Rose" refers to "Mr. and Mrs. Henry Smith" and that they have a particular address, or phone number, with particular likes and dislikes, etc. so that when the user references "Hank and Rose " the intelligent agent can then supply other corresponding information necessary for the task at hand. Databases, which generate a profile of user preferences by interactive questioning, by recording a history of the user's actual choices, or by some other means or combination of means can function with intelligent agents. Other functions preformed by and utilized by intelligent agents include inference ranking rules that would suggest which choices an individual most prefers or which alternatives an individual might prefer and programs or methods based upon relationships and likenesses among possible choices, as well as rankings

determined by polling like-minded individuals (such as the Firefly system, by which individuals list favorite records or books, the program groups individuals with similar likes, and then infers that other records or books enjoyed by an individual would be enjoyed by similar individuals even if the similar individual had not listed the records or books). Intelligent agents can search out information, data, products, merchants, services, and the like, which meet pre-specified criteria. For example, an intelligent agent could search for the best price for a particular product, the best quality among similar products, or the "best" ratio of price to quality. Additionally, an intelligent agent can search for the "shortest" layover time in an airplane flight schedule or the "shortest" total travel time when multiple airports are available with various transportation links. The criteria might be generated by internal rules, specified by the user, inferred from prior user choices, or from learned knowledge. The term intelligent agent refers to a device or software, which accomplishes one or more of the above or similar operations.

A system according to the invention can be implemented in a mobile device, e.g., cell phone, personal digital assistant (PDA), a vehicle, a transportation system (e.g., train, boat, airplane, or bike), or even a fixed location to provide a user with his desired information anytime, anywhere.

The present invention, system and method for dynamic management of information, functions as an information agent. In particular, the information delivery order is based on user's preference and the information associated with the user's location information. For example, if the agent detects a traffic jam (via the continuous searching for the traffic information of the user's driving route), the agent can provide alternative route information and interactively instruct the user to do so. The corresponding user's schedule (meeting, flights etc.) can be re-scheduled accordingly.

Referring to FIG. 1 there is shown a high-level schematic/block diagram of a communication network employing the present invention system and method for dynamic management of information. A user 102 accesses a PDA 104 or other digital device (personal computer, laptop computer, etc.), which contains a wireless communication interface 106. The wireless communication interface connects to a wireless communication portal 108 such as a mobile base station (BS) or a radio access port (RAP) via a wireless link 110. The wireless link 110 can be a PCS connection, cellular connection, satellite connection, wireless data service or wireless local area network (WLAN) service. The communication portal 108 connects to the Internet 112 through a TCP/IP compatible interface. The TCP/IP connection may be direct or through a local network. A variety of digital communication portals are accessible over the Internet, including: voice mail 114 through a voice mail interface/agent 116; e-mail 118 through an e-mail server 120; data files 122 through a file server 124; and other portals. An intranet 126 having a secure server 128 may be accessed through a firewall 130.

An interactive communications agent 132 operating in the PDA 104, cellular phone, or other digital device having communication capabilities, establishes a communication channel via the wireless link 106, through the communication portal 108 to the Internet 112. The communication channel can be a virtual channel, which may not have a physical connection at all times but the connection set up overhead is minimized. When packet or circuit transmission is needed, the channel can be established with minimum delay.

Communication data may be in the form of data files 122, e-mail 118, voice mail 114 or in other standardized forms accessed through a variety of servers and corresponding interfaces. Intelligent appliances, such as automobiles, may also be accessed, enabling information to be transferred or systems controlled.

Should the data server be a secure data server 128 resides within an intranet 126, which is protected by a firewall 130, the interactive communications agent 104 will establish a different communication channel to the secure data server 128 as if the user 102 logged in remotely. The user established preference profile has the user's identity necessary for security to connect through the firewall system into the intranet 126.

One embodiment of the present invention, system and method for dynamic management of information is implemented with a mobile device (e.g., cell phone, PDA), which may be located in a vehicle, a transportation system (e.g., train, boat, airplane, or bike), or even a fixed location to provide a user with his desired information anytime, anywhere. Rather than requiring that the position of the user to be determined by a global positioning system application, inherent within the wireless communication network is a relative positional detection system. This system is used to determine the relative position of a cell phone (by the cellular base station) for handing offing calls between cells. Additionally location information can be provided by serving cell site location, cellular system location detection/precise info etc.

Similar inherent position detection systems are embedded in PCS and other digital wireless communication networks. Additionally, intelligent agents that resident in or access various devices, such as an automobile or personal computer, can be used to determine the relative location of a user, status of the device and control the device. In one embodiment, position of the wireless communication device is determined by various devices of the user, which interface to the communication network. This determination is made by the device detecting the proximity of the user's wireless signal, such as having the wireless device inside a vehicle.

Referring to FIG. 2 there is shown a high-level block diagram of the present invention system and method for dynamic management of information employing a

plurality of intelligent communication agents 132. Similar elements having similar functionality are assigned the same reference numbers as used in FIG. 1. Each intelligent communication agent 132 accesses the communication network through a communication portal 108. Where multiple interactive communication agents 132 are installed at various systems (e.g., multiple cars, home, office, etc.) for one single user, the multiple agents can be synchronized to a master agent 202 or an agent synchronizer in the network.

Synchronization between the master agent 202 (or agent synchronizer) and local intelligent communication agents 132, is done periodically or triggered by predetermined events. The events may be predetermined by the intelligent agent or selected by a user. In one embodiment, the method of synchronization is defined in the user profile. For example, if a user controls several local agents 132 (e.g., cars, multiple personal computers, PDA, cellular phones, etc.), the user can choose to synchronize the local agents in a periodic manner. This synchronization is done by setting an internal timer at each local agent 132 and when timer expires at a particular local agent 132, that local agent 132 will synchronize up with the master agent 202 (or agent synchronizer). This enables setting different timers at different local agents 132. For instance, the local agent 132 located in a car driven daily, it might choose a short timer to update.

Alternatively, the synchronization among local agents 132 can be done by selecting a predetermined time for synchronization. For example, the local agent 132 in the car used regularly driving to office, is synchronized on weekdays, every morning before driving to the office and every afternoon before driving home. Synchronization is not typically required on weekends if the user regularly uses a different car (pleasure vehicle) during weekend. Furthermore, when the user uses different cars during weekdays and weekends, the local agents 132 are programmed differently to fit the

particular user's need during weekdays and weekends. During weekends, the user may desire to receive information regarding family fun events, sports events etc.

In yet another embodiment, synchronization among agents is event triggered. Events may be when a user enters a car where a pre-synchronization has not occurred and synchronization is not yet programmed. Activation of a vehicle security system (alarm, transponder, etc.) can force synchronization and alert the master agent 202 (or agent synchronizer) of a potential security breach.

Referring to FIG. 3 there is shown a high-level block diagram of the present invention system and method for dynamic management of information employing a plurality of intelligent communication agents 132 and multiple users. The user may use an identity device that is interfaced to (plugged into) an agent system 132. Therefore an agent system can be made generic for everyone to use. For instance, an airplane or a train may provide such agent services to all the passengers. Each passenger plugs in a user identification device and then the agent system around the user's seat can become the user's personal agent. An identity device can be an active device such as electronic card, magnetic card, PDA (personal data assistant, e.g., Palm Pilot, palm computer), cellular phone, portable computer, biological device (e.g. retinal scan, finger print, etc.), or any passive device (e.g., a key, an plastic device, etc.)

The interactive communication agent 132 presents the user 102 with desired information as a personal mobile secretary. The user desired information (or equivalently the search criteria) is determined by user's real time keyword inputs and the user's preference profile.

The functionality of the interactive communication agent may be separated into an interactive agent, a search agent, and master agent. The search agent searches the intranet, Internet, voice mail systems, paging networks and other communication systems

in order to obtain the user desired information. The interactive agent then presents the user with the most wanted information at a particular time and handles the user interface. The interactive agent is further capable of communicating with the user to dynamically define user preferences and profiles, which are used by the search agent and the interactive agent. The master agent coordinates and synchronizes multiple search agents as well as can interface with at least one or more interactive agents. This coordination may be on a master synchronization level or a peer-to-peer level.

In one embodiment, the interactive agent can interface to devices for which the user desires to control, such as starting a car, accessing a home or office appliance control/security system to check on security status, activate an air conditioning system or adjust a heating system to reach a comfortable level as the user enters the home.

According to a user preference profile, the interactive communication agent may deliver information to the user based on the profile once the user activates the system. For instance, when the user's transportation system is activated, the interactive communication agent, located in the vehicle, starts to present the user with current weather conditions, traffic conditions, stock quotes and news headlines as determined by the user profile. The order of information delivery and range of interests for the information are specified in his user preference profile.

The interactive communication agent, without interaction from a user, can collect and update the information based on the user preference profile. That is, the information collection/update can be periodic and/or ahead of time (i.e., while the user is not actively using the system) to maintain the information most updated. Ahead of time processing or periodic processing can take advantage of discounted service charges during off peak access times. For example, every morning if the user would like to obtain yesterday's performance and related events/news of certain stocks, the interactive communication

agent in the transportation vehicle can update that information during early morning (before peak hours) and reduce wireless access charges.

Ahead of time and/or periodic information update can also save the potential delay. This is particularly the case when the user gets on the system and would like the agent to provide certain information immediately. For instance, every morning when the user gets on his vehicle, he would like to know the current weather and traffic conditions.

It is highly likely many other users will desire this information as well. Therefore the request for this information during peak times such as the morning rush hours would result in access and communication delays. Ahead of time and/or periodic information update can minimize the delay for the user and distribute the network information traffic more evenly over time.

When the interactive communication agent accesses the various information sources, the interactive communication agent can perform difference check or time-stamp check and only updates the difference or the newer information. Alternatively, the interactive communication agent can decide to perform an entire refresh download if the item has not been refreshed for a relatively long time. The interactive communication agent can clear some out-dated information in the data buffer to maintain concise information to serve the user.

Upon a user's request for certain information, the interactive communication agent can inform the user what the agent has in its data base(s) with the associated time stamp. Then the interactive communication agent accesses an intranet and/or the Internet to search and update. The user can abort the search if the user believes that the information obtained from the agent is sufficient and that a real time update is unnecessary. However, the periodic and/or ahead of time update of that information can still follow the schedule as defined in the user preference profile.

With knowledge of the user's schedule, the interactive communication agent can automatically check the related events and feedback to the user if the scheduled events have changed or have potential to change. For example, if the user is leaving home to catch an airplane flight, the interactive communication agent will check with the airport for any travel related delay conditions as well as the current flight schedule. Should a delay or flight cancellation be confirmed or expected, the interactive communication agent will notify the user immediately. When events such as flight delays occur, according to the user preference profile, the interactive communication agent may initiate further actions to assist the user. Such as, upon a flight cancellation, the interactive communication agent can immediately book another flight for the user, re-arrange the subsequent flights, hotel, car rental, limo transportation, and notify others of a meeting delay or cancellation.

The interactive communication agent's database is defined by the user preference profile. That information includes what information shall be stored, how information is classified and how often the information shall be updated or discarded. The interactive communication agent can perform various communications management functions according to the user preference profile. The interactive communication agent can detect and register a user's location. The user's location can be presented in many formats such as geographic location (e.g., longitude and latitude or equivalently the street address, intersection of streets, etc.) and logic location (what number can be reached, what Internet address is active for the time being, etc.). The active Internet address can be a mobile address changed from time to time. The user can choose to use one or another format, such as the user may choose to register the Internet address but not the phone number and not the geographic location while the user is on vacation. Alternatively the user may need

to register a specific geographic location so the user's manager(s) can determine the user's location and give more accurate directions.

The interactive communication agent can receive calls for the user. For incoming calls, the interactive communication agent can advise the user who is calling and ask whether the user would like to pick up the call via interactive communications environment. Alternatively, the interactive communication agent can screen the calls using caller ID or other forms of identification in relationship to the user's preference profile. If the user decides to pick up the call, the interactive communication agent will connect the incoming call with the user and the user will then talk interactively with the caller via the interactive communications environment. If the user decides not to pick up the call, the interactive communication agent will then forward the call to a voice mail system either in the network or near the interactive communication agent. The user can choose to monitor what message the caller is conveying into the voice mail system and those interact directly with the caller after screening the call, at which time the interactive communication agent then will connect the user with the caller.

The interactive communication agent can originate calls for the user. The user may just input a name or alias and the agent will then find the phone number and connect the user to the intended called party or the agent may deliver a message on behalf of the user, such as the user will be delayed, etc. The intended called party may consist of several people, which will result in a conference call being set up by the interactive communication agent. The user may request the interactive communication agent to wait until all parties are on before connecting the user, allow the user to monitor the conference but be silent, or to join in at any time. The intended called party can be defined by an alias, several aliases or just a group of names. According to the user

preference profile or the user's commands, the call can be in the form of voice mail and sent to the intended called party's voice mail instead of a real time voice call.

The interactive communication agent can receive messages for the user. According to the user preference profile, the interactive communication agent can check the user's messages (e.g., e-mails, voice mails, instant messages, etc.) periodically or by schedule and then notify the user with such incoming messages. For certain kinds of messages (e.g., e-mails with highest priority, e-mails from a particular source, instant Internet messages, voice mails, messages sent to certain accounts, or messages that match pre-defined keywords), the interactive communication agent can immediately alert the user. That notification of messages can include some important parts of the messages such as sender, subject, time stamp, or text that matches the pre-specified keywords. Should the user decide to take certain messages, the interactive communication agent then presents the messages (verbally or otherwise) to the user through the interactive communication environment.

The interactive communication agent can originate messages for the user. If the user wants to send a message(s) to an intended party (which may consist of several people), the user can "input" the alias of the intended party and then "input" the messages as if the user is writing e-mails. The "input" method is defined in the interactive communication environment. Should the user need to attach other information (such as files, voice mails, e-mails, etc.) in the message, the user instructs the interactive communication agent to do so. The interactive communication agent then locates the needed attachment from the interactive communication agent's database, the user's file system, the user's e-mail system, the user's voice mail system, or other source.

The interactive communication agent can send commands to functional devices that are under the user's power. For instance, on the way home after work, the user may

want the air conditioning or heating system in his home adjust to a comfortable temperature (which can be defined in the user preference profile) by the time the user arrives home. The interactive communication agent can perform this particular function by sending control messages with the user's authority to the user's home's air conditioning or heating system. The timing for sending such a control message can be determined by the interactive communication agent. The interactive communication agent can estimate timing by utilizing information on user's location, the traffic condition, weather condition, and time needed for the air conditioning or heating system to adjust to the desired temperature. Transmission of such control messages can be with or without user's direct guidance depending on the user preference profile. A second example: on the way home after work, the user may want to check what groceries are needed when the user stops by a super market. The interactive communication agent sends control/inquiry messages to the user's refrigerators and food pantry. A shopping list is then presented to the user.

The interactive communication agent can remind the user with scheduled events/appointments (such as a meeting or conference call) via interactive communications environment. In addition, the interactive communication agent can provide early warning and assistance to the user if the user has difficulty following the schedule. For instance, if the user is stuck in a traffic jam or on a plane with a significant delay at the destination airport, the interactive communication agent can estimate the difficulty for the user and alert the user of the coming scheduled events, which may be missed. The interactive communication agent may, upon the user's consent, notify other parties associated with the coming events, which the user cannot attend, with the user's delay information. The interactive communication agent can re-arrange scheduled events for later time for the user by communicating with other parties associated with the events.

User Preference Profile

The user preference profile defines the user's range of interest and keyword sets, therefore it minimizes the volume of data to be searched and the volume of information to be delivered. The user preference profile enlists a default order of information to receive when the user activates the system. The user preference profile specifies aliases and corresponding addresses or telephone numbers for user's intended communication party. The user preference profile maintains a schedule book to remind the user of appointments and events. The user preference profile can (by user's set up) memorize user's identity, confidential information, biological characteristics, account information, and passwords so it can command in user's power/authority.

The user preference profile defines the agent's database. That includes what information shall be stored, how information is classified and how often the information shall be updated or discarded. In general, the structure of the user preference profile is separated into two parts: information flow and communication services. Information flow consists of an interest range, an update/synchronization option, and a delivery priority. The interest range is used to define keywords, commands and expansion of a search range. In particular, the order of expansion for the search range can be defined via an interest list. In one exemplary embodiment, where the user holds a position in the wireless business division of a company, the user's interest list may be as follows:

Internal wireless business development;

Internal wireless product schedule and production management;

Internal wireless technologies;

Internal overall business;

Internal organization changes;

External competitors business development;

External competitive technologies;

External information technologies;

Etc.

In the above example, "internal" means within the user's company (i.e., intranet) while "external" means outside user's company. Once a user issues a command, "give me news of today", the search range will then be expanded according to list and gives the user with the proper info. The update/synchronization system includes the mechanism for when and how the information is to be updated or synchronized, as previously described above. The "life span" of information (based upon kind of information) is defined such that outdated information will be discarded to save memory space. Delivery priority is the default list when a user activates the system, without a user's direct guidance, the communication agent automatically delivers the information to the user. The priority list can be set differently for different time. For example, in the morning drive to office, the delivery priority order can be:

Traffic and routing information from home to office (one direction)

Today's schedule/appointments

Global and US economy, overall stock market environment

Specific stock performance and related news (stocks that the user have at hand, the user is interested, and competitors')

News of the day (according to the interest range)

Etc.

During the evening drive back to home, the delivery priority order can be:

Traffic and routing information from office to home (one direction)

Tasks remained to be done that evening if any

Tomorrow's schedule/appointments

Overall stock market results

Specific stock performance and analysis

News of the day, evening version (according to the interest range)

Etc.

The communication service system includes a contact book, schedule book, and personal identity. The contact book defines entry and alias information for all the persons, organizations, or even machines/devices as well as related group that will be contacted. The contact methods include telephone number(s), fax telephone number(s), e-mail address, IP address, mailing address, etc. The schedule book tracks all the meetings and appointments for the user. The schedule book includes long term reminder information and predefined calculations. For example, the user's car requires an oil change every 5000 miles or 6 months, whichever comes earlier. The intelligent agent thus actually traces the event and then books an appointment for the user at a suitable service facility. The portion of personal identity includes the user's authority to issue commands to machines/devices, user's private key sequence for digital signature on documents, etc.

Modification of the user preference profile can be done via web, PC software, interactive voice, point and click device, keypad, and control sticks etc.

Real Time Interactive Communications between the User and the Agent

An interactive communication environment is set up when the user activates the system. For communications from the user to the interactive communication agent, the information can be delivered utilizing voice recognition (with ear phone speaker or not), point and click device, keypad, control sticks, as well as various other technologies. For communications from the agent to the user, the information can be delivered utilizing a synthetic voice (with ear phone or not), monitor display, projection screen (e.g.,

projection onto vehicle's wind shield – heads up display), as well as various other technologies.

While delivering each session of information to the user, the delivery process can be paused, stopped, skipped, replayed, fast forward & backward, etc. through the interactive communications environment such as with voice commands. The user can change the default delivery order (e.g., skip some items, obtain some items first, etc.), and can issue a new search (within or outside of the default delivery order) through the interactive communications environment such as with voice commands.

The system activation process (for a user to start using the agent) requires a user to be authenticated. This may be accomplished by utilizing a password, personal confidential information (e.g., birth date, family member, marriage date, etc.), biological characteristics (e.g., finger-prints, eye-ball scanning, voices, faces, palm, hairs, etc.), or combinations of those. While the user is using the agent, according to the user preference profile, if the user would like to perform a particular function, which requires further verification, the agent would challenge the user to provide a further information to authenticate the user's identity. For example, the user preference profile can specify that if the user desires to transfer financial funds, this action would required an additional type (level) of verification.

Referring now to FIG. 4 there is shown is a high level diagram of a system employing the local interactive communication agent. . In this particular embodiment, the intelligent agent communication system 402 includes a microprocessor 404 or other suitable digital processor, with adequate local memory 406 for processing all the information and communication services required by and handled by the local interactive communication agent. The user preference profile resides in the memory 406 which is coupled to the microprocessor 404, thus enabling easy handling of information and

communication services according to the user preference profile. A digital signal processor 408 is used to process signals in the interactive communication environment. One typical example is to use synthetic voice 410 and voice recognition 412 between the user and the local agent. Since voice is analog signal, an analog-digital converter 414 is thus needed in front of the digital signal processor 408. The local intelligent communication agent connects the wireless link 416 to facilitate information flow and communication services. The agent may connect to an external wireless transceiver 422 independent of the local intelligent communication agent to establish the wireless link or alternatively, the agent itself may include RF transceiver 418, logic circuit 420 and use the digital signal processor 408 and microprocessor 404 together to perform the wireless transceiver function. One typical example is to implement GSM, WCDMA or CDMA (IS-95) cellular transceiver together within the local agent, thus enabling automatic cross network compatibility.

While the present invention has been particularly shown and described with reference to the preferred embodiments thereof, the embodiments are not intended to be exhaustive or to limit the present invention to the precise forms disclosed herein. It will be understood by those skilled in the art that various changes in form and detail may be made therein without departing from the spirit and scope of the invention. Similarly, any process steps described may be interchangeable with other steps in order to achieve substantially the same result.

WHAT IS CLAIMED

1.   A method for executing tasks, in a communication network having a wireless communication device for communicating with a wireless network, comprising the following steps:

accessing a user preference profile;

providing an intelligent agent communication interface;

determining a relative position of the wireless communication device wherein determination of said relative position is inherent to the wireless network;

interacting with the communication network as a function of said relative position and said user preference profile; and,

delivering information to the wireless communication device as a function of said relative position and said user preference profile.

2.   The method as recited in claim 1 further comprising the step of synchronizing with a second intelligent agent.

3.   The method as recited in claim 2 further comprising the step of said second intelligent agent interacting with the communication network as a function of said user preference profile.

4.   The method as recited in claim 1 wherein the step of interacting further comprises controlling an external device.

5. The method as recited in claim 1 wherein said intelligent agent communication interface provides an interactive link between said user and the communication network.

6. The method as recited in claim 1 wherein said the step of interacting with the communication network involves voice, e-mail and facsimile communications.

7. The method as recited in claim 1 wherein interacting with the communication network is a function of direction of motion of said relative position.

8. The method as recited in claim 1 further comprising interrogating an identification module interfaced to said intelligent agent communication interface.

9. The method as recited in claim 1 further comprising the step of anticipating said relative position of said user.

10. The method as recited in claim 1 further comprising the step of interacting with an intelligent communication agent of another user.

11. The method as recited in claim 10 wherein the step of interacting with an intelligent communication agent of another user is a function of said relative position of said user.

12. The method as recited in claim 10 wherein the step of interacting with an intelligent communication agent of another user is a function of a relative position of said another user.

13.   A system for executing tasks, in a communication network, comprising the following steps:

an intelligent agent communication interface;

a wireless communication device;

a means for determining a relative position of said wireless communication device wherein determination of said relative position is inherent to a wireless communication network; and,

an intelligent agent for interacting with the communication network and delivering information to said wireless communication device as a function of said relative position and a user preference profile.

14.   The system as recited in claim 13 further comprising a means for synchronizing with a second intelligent agent.

15.   The system as recited in claim 14 wherein said means for synchronizing is a function of said user preference profile.

16.   The system as recited in claim 13 further comprising an interactive link between a user and the communication network.

17.   The system as recited in claim 13 wherein interaction of said intelligent agent is a function of direction of motion of said relative position.

18.   The system as recited in claim 13 further comprising an identification module interfaced to said intelligent agent communication interface.

19.   The system as recited in claim 13 wherein interaction of said intelligent agent is a function of anticipating said relative position.
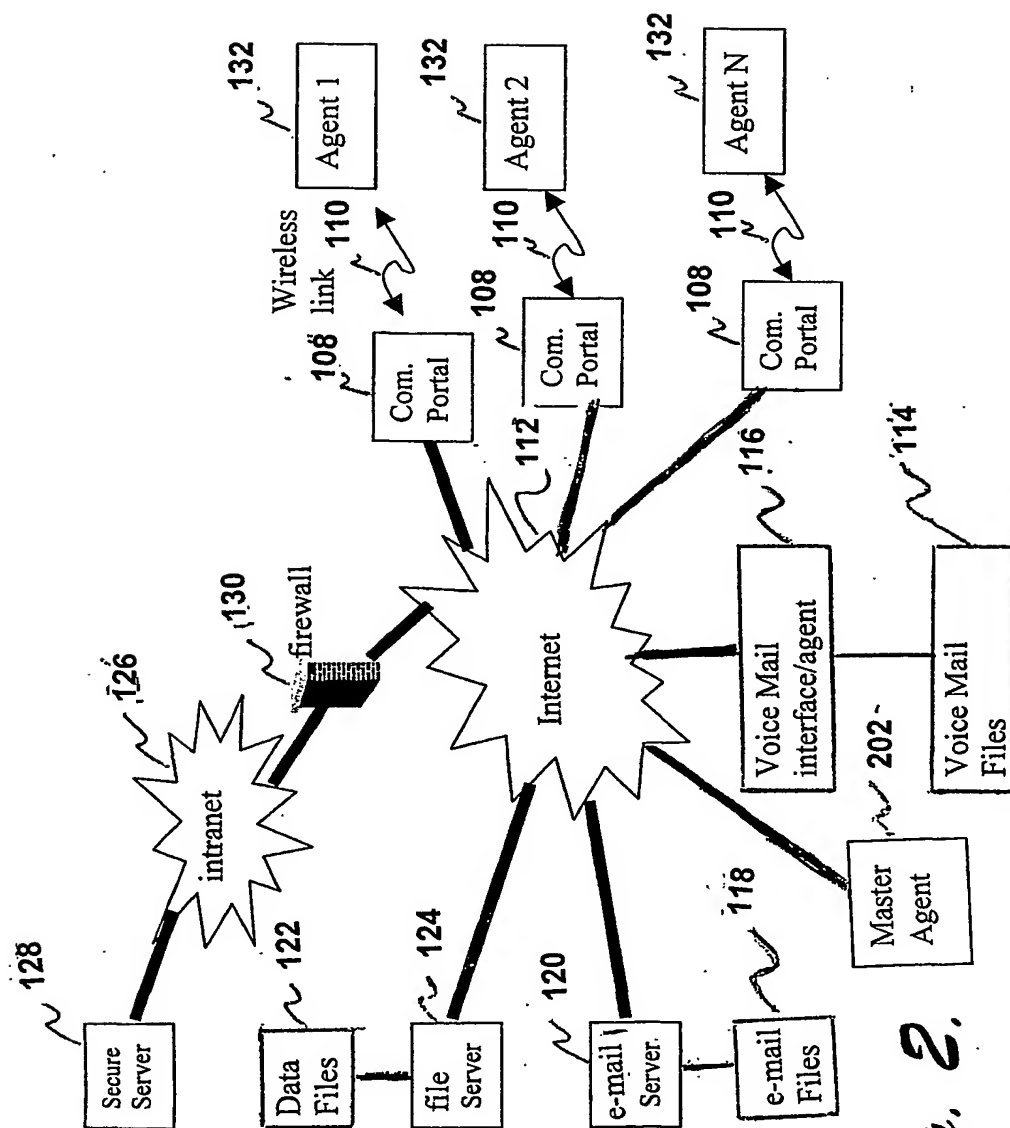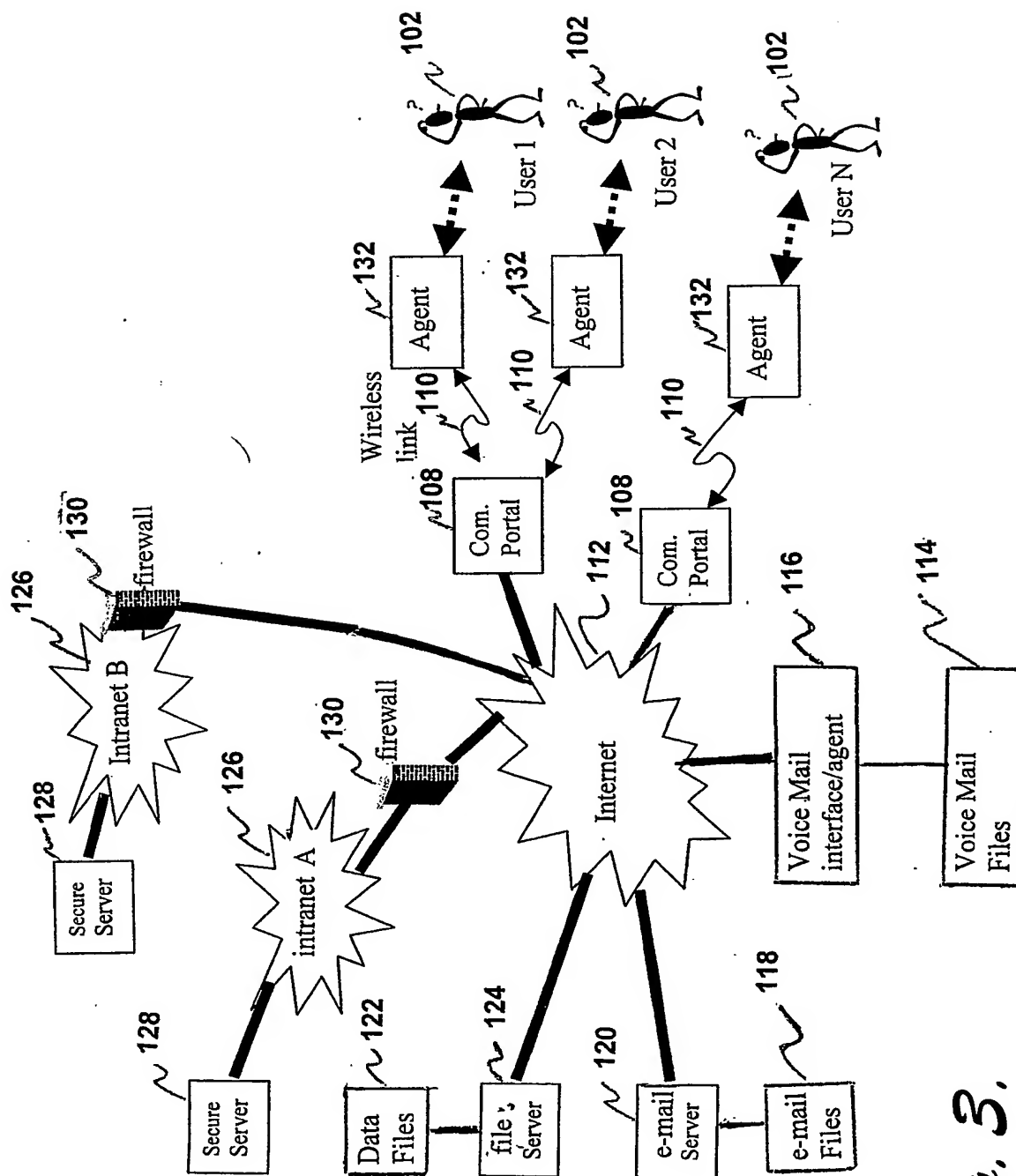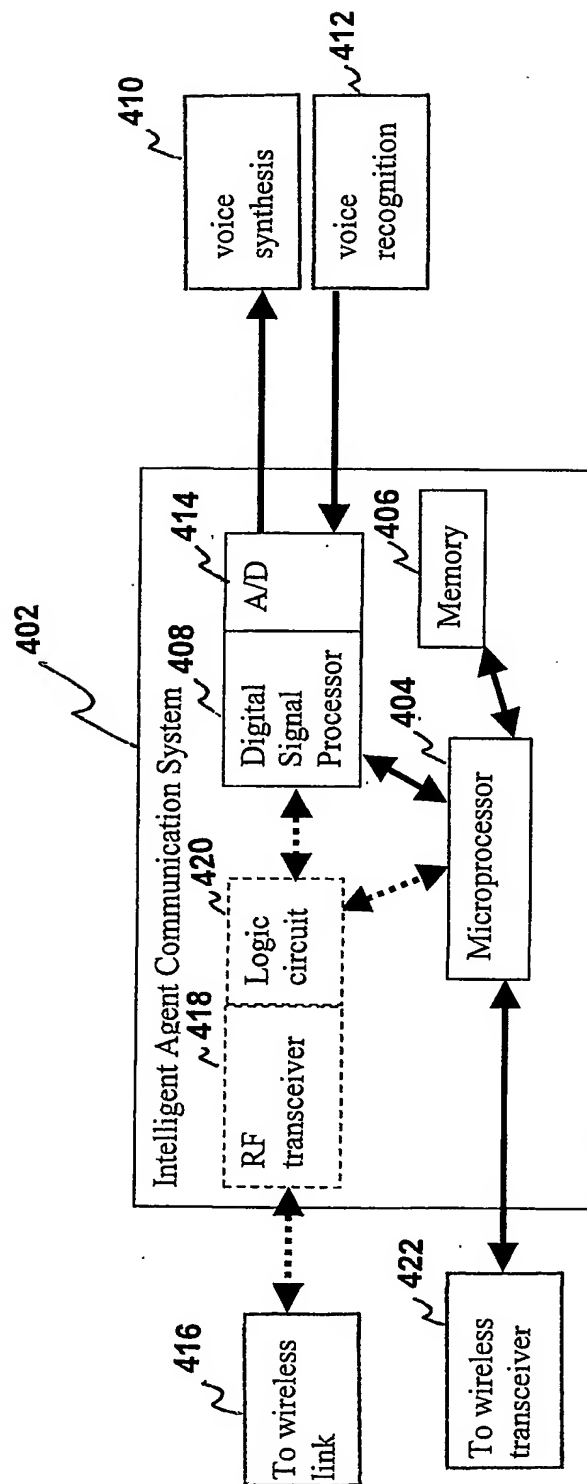
Fig. 1.

Fig. 2.

Fig. 3.

Fig. 4